DOCUMENT RESUME

ED 146 529 CG 011 977

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TITLE Training Referential Communication Skills: The Relative Effects of Plans and Modeling.
SPONS AGENCY National Inst. of Mental Health (DHEW), Rockville, Md.
PUB DATE Apr 77
GRANT MH-29423-01
NOTE 27p.; Paper presented at the annual meeting of the Eastern Psychological Association (April 13-16, 1977, Boston, Massachusetts); For related document see CG 011 976

EDRS PRICE MF-$0.83 HC-$2.06 Plus Postage.
DESCRIPTORS *Auditory Training; Children; *Communication Skills; *Listening Comprehension; Listening Skills; Perception Tests; *Performance Factors; Primary Education; Psychological Studies; Research Projects; *Skill Development; *Training Techniques

ABSTRACT

This study investigates both immediate and delayed effects of two different training procedures on children's listener behavior in a referential communication setting. Using a 2 x 2 design, the presence and absence of a plan for effective listening and modeling of appropriate listener behavior were varied, and the effects of these variations on 40 first graders' performances as listeners were assessed. An immediate test employed referent items which were both similar and dissimilar to those used in the training phase. The delayed test, using new referent items, was presented two to three days after training. In accord with predictions, results showed that children who had received training gave considerably more adequate listener performances than no-training control subjects on the immediate test, with both types of referent items. Moreover, effects of training were undiminished on the delayed test. Contrary to prediction, however, presentation of both types of training together was no more effective than either type separately. Since these findings stand in sharp contrast to the generally negative findings of previous attempts to train children's communication skills, possible explanations for the relative power of the present procedures are considered. (Author)

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Training Referential Communication Skills: The Relative Effects of Plans and Modeling

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This paper, presented at the Eastern Psychological Association Meeting, in Boston, during April 1977, is based in part on a Ph.D. dissertation submitted to the Department of Psychology at the University of Virginia. This research was supported by NIMH grant MH29423-01 and by a Wilson Gee Institute grant to the second author. We are grateful to Cindy Blow, Tyree MacFarland, Penny Myers, Skip Orza, Mark Perry, and Scott Wiley for their assistance at various stages of the conduct and analysis of this study. Special thanks are due to Mr. Roland Zimmerman, principal of the Woodbrook Elementary School in Charlottesville, Virginia for his outstanding cooperation. Requests for reprints should be sent to J. Michael Cosgrove, who is now at Applied Management Sciences, Inc., 962 Wayne Avenue, Suite 701, Silver Spring, MD 20910; or to Charlotte Patterson, Department of Psychology, University of Virginia, Charlottesville, Va 22901.

CG 011 977

One of the crucial achievements of childhood is development of the ability to communicate with others by means of spoken language. Studies of children's communication have often employed a referential communication paradigm in which the speaker is asked to transmit, by purely verbal means, a specified piece of information to a listener. Although adequate communication in this setting clearly requires involvement on the part of both speaker and listener, research has focussed primarily on the role of the speaker. The frequent failures in children's communication have been attributed mainly to the inadequacy of messages formulated by young speakers (Fry, 1966; Glucksberg, Krauss & Higgins, 1975; Glucksberg, Krauss & Weisberg, 1966; Krauss & Glucksberg, 1969; Shantz & Wilson, 1972; Whitehurst, 1976).

While the importance of the speaker's behavior is well documented, the listener can also influence the success of referential communication in a dyadic situation (cf. Glucksberg et al., 1975). For example, a listener can assess his own degree of certainty about the identity of the referent. If he needs more information, he can convey this fact to the speaker. The listener can also specify the nature of the additional information he requires. Indeed, some evidence exists to suggest that even very young speakers can be expected to formulate more adequate messages when exposed to this kind of feedback (Peterson, Danner & Flavell, 1972). Thus, listener behavior may have an important impact on the communicative success of speaker-listener pairs.

In spite of the obvious importance of effective communication, few researchers have attempted to train children's communication skills. Almost all such attempts have focussed on the training of speaker skills (Dickson, 1974; Fry, 1966, 1969; Shantz & Wilson, 1972; Whitehurst, 1976), and most have met with relatively limited success. In particular, although some improvement of communicative efficacy has been observed to result from various training procedures, generalization to new materials--where assessed--has been weak (Shantz & Wilson, 1972) or

inappropriate (Fry, 1966). Whitehurst (1976) reported a highly successful attempt to train children's speaker skills via modeling procedures, but his study included no measures of generalization.

One study which attempted to facilitate children's performance in the listener role was reported by Cosgrove and Patterson (in press). In this study, children at each of four ages (4, 6, 8, and 10 years) served as listeners in a referential communication game. The speaker, an adult confederate, produced messages of varying informational adequacy. Midway through the game, half of the children at each age were given a plan emphasizing the importance of asking for more information if the speaker's message was inadequate. Significant development of listener skills was observed; during the first half of the game, older children spontaneously made more requests for additional information and made more correct referent choices than younger children did. Of greater importance in the present context, however, was the finding that the introduction of a plan for effective listening substantially improved the average listener performance at every age except the very youngest.

The Cosgrove and Patterson (in press) study demonstrated that important listener skills can be facilitated by giving children plans for effective listening. At the same time, however, it left a number of intriguing questions unanswered. For example, although substantial improvements in the performance of all but the youngest children were observed, only the performances of the 10 year olds approached a fully adequate level. How might further improvement among younger children be generated? In addition, in that study nc measures of generalization were taken. How well might these changes in performance be expected to persist across time and materials? The present study was undertaken to explore these questions.

We sought to facilitate children's listener performances both by the use of plans for effective listening (as in Cosgrove & Patterson, in press) and by the introduction of modeling procedures. The fact that modeling can influence young

children's behavior in a variety of different situations has been amply documented in recent years (Bandura, 1969, 1977; Hetherington & McIntyre, 1975; Liebert, Neale & Davidson, 1973). The success of this approach in facilitating children's speaker skills (Whitehurst, 1976) also suggests its potential efficacy as a tool for training listener skills; however, no efforts to facilitate listener behavior in this way have been reported. The present study was designed to explore the possibilities of modeling as a technique for training young listeners, and also to investigate the possibility that modeling and plans together would be more effective in enhancing children's performances than either method alone.

To assess the degree to which these training procedures produce lasting, generalized (i.e., internalized) as opposed to momentary, specific changes in children's communication, measures of generalization were also included. The effects of the training procedures were assessed in an immediate test, using both familiar and unfamiliar stimulus materials, and also in a delayed test, after an interval of two to three days.

We expected children who received training to perform more effectively overall than those receiving no training, and subjects exposed to both kinds of training to be more successful than those receiving either kind separately.

Method

Design and Overview

The study involved a 2 x 2 design which varied presence and absence of plans for effective listening and modeling of appropriate listener behavior, and assessed the impact of these variations on children's performances as listeners in a referential communication task. An adult confederate played the role of the speaker, and produced messages of varying informational adequacy. Half of the children were given a plan for effective listening. Orthogonally, half of the children were exposed to a brief videotaped modeling sequence. Effects of training were assessed in both an immediate and a delayed test, and using both

nameable and abstract stimulus items. Major dependent measures were the number of requests for more information and the number of correct referent choices.

Subjects and Experimenters

Forty first graders (23 boys and 17 girls) from a predominantly middle class elementary school served as subjects. Their mean age was 6.9 years. Children were randomly assigned, 10 to each treatment condition, divided by sex as evenly as possible. A female undergraduate served as the experimenter. A male graduate student served as the speaker during the immediate test, and a male undergraduate was the speaker for the delayed test.

Experimental Setting and Materials

A small table and two chairs were placed in the experimental room. A divider was placed in the middle of the table so that a person seated at either end of the table was unable to see the table top on the other side of the divider. A video camera and microphone allowed for unobtrusive recording of each session. A television monitor was placed within viewing range of the listener.

The set of stimulus items for each trial were drawn onto posterboard cards, measuring approximately 22.5 cm by 30.0 cm. The cards were divided into four sections, one for each of the potential referents for the trial.

A similar set of cards was prepared for the speaker. These were identical to the listener's cards except that they were cut into four sections. Only one such section was put in front of the speaker on any given trial. Thus, while the listener saw four potential referents on each trial, the speaker saw only the target referent. This procedure made it seem more plausible that the speaker's initial messages were sometimes uninformative.

There were several types of stimulus sets. A practice set consisted of pictures of four easily identifiable common animals. There were 12 other sets of "nameable" referent items (e.g., people, bottles, clown faces). Each set varied systematically in terms of two binary attributes so that an adequate

description of one referent always required specification of both attributes. For example, an adequate description for the "people" set indicated whether the referent item was wearing red or blue, or was male or female. Other stimuli, drawings of abstract figures which also varied systematically in terms of binary attributes as just described, were introduced to assess generalization of training. These were designed to be more difficult than the nameable items, since the relevant attributes and dimensions of the drawings were often difficult for young children to describe (e.g., smooth vs. jagged base, hole in center vs. no hole).

Reward certificates ("Good Player Awards") were identical to those described elsewhere (Cosgrove & Patterson, in press).

Procedure

Upon entering the room, the experimenter seated each subject at the table, opposite the adult speaker, and introduced the speaker. She explained the mechanics of the game, that there was only one rule (i.e., that the listener could not peek around the divider at the speaker's card), and that the child should feel free to do anything else that might help him choose the correct answers. The experimenter explicitly indicated to all subjects that they were free to talk to either of the adults as much as they desired, but said nothing about question-asking per se. The child was shown a Good Player Award, and told he could win one if he did well on the game.

At this point, all of the listeners were given three practice trials, one with each type of message (fully informative, partially informative, or uninformative) to be used in the game. A fully informative message provided all of the information necessary to allow selection of the correct referent (i.e., named the two relevant attributes for that referent). A partially informative message named only one relevant attribute, thus narrowing the choice to two of the four potential referents. An uninformative message described only features shared by all potential referents, providing no useful information. Thus, for example, the uninformative message for the "people" set described above was, "it's a person".

After the practice trials, children who were to receive modeled training watched a three minute videotape of an adult model playing the game. The model briefly reiterated the instructions, and then played six trials of the game, two trials with each type of message. The model noted aloud when she did not have enough information to choose the correct referent and elicited (via questions) further information from the speaker when appropriate. For example, with a referent set consisting of a red circle, a blue circle, a red triangle, and a blue triangle, and in response to the message "It's a circle," the model would say, "Gee, I don't know which one it is; there are two circles here. Is it red or is it blue?" She chose all of the correct answers. At the conclusion of the tape, the model was given a Good Player Award.

The listeners then received one of two types of instructions, or in the case of the no model condition, the instructions followed immediately after the practice items. For all subjects, the experimenter introduced the instructions by saying,

> Let's try to think of something you could do to help you play this game even better. Let's see ... I know what you can do!

Subjects in the plan condition were then told:

> Whenever you are not sure what the right answer is, you can ask questions to help yourself figure it out.

Subjects in the no plan condition were told:

> You can keep on remembering that the only rule in this game is that you can't look on the other side of the table.

The instructions for both conditions were elaborated and repeated in a standard fashion.

Following the presentation of instructions to the listeners, all children were given a standard six-question interview assessing their understanding of the rules of the game. Any misunderstandings were corrected.

All children then completed 18 trials of the referential communication task. The first nine items were the easily nameable items; the last nine trials used

abstract figures. The speaker produced equal numbers of informative, partially informative, and uninformative messages for both the nameable and abstract items. This allowed an assessment of children's tendencies to ask questions in general (i.e., apart from any task-related need for information) as opposed to their tendencies to do so in an appropriate manner.

Since listeners' questions were a major dependent measure, and since the incidence of children's questions is affected by adult responses to them (Ross & Balzer, 1975), feedback to subjects' questions was carefully controlled. Children's questions were always answered truthfully, and in the declarative mode. After the last trial, the child was given a Good Player Award and requested not to talk about the game with other children.

Between 48 and 72 hours after the completion of the immediate test, the children returned for twelve more trials[1]. Each child was reminded of the basic rules of the game, and introduced to a new adult speaker who--unlike the first speaker--was blind to the child's experimental condition. No reminders about the independent manipulations from the first session were given. Again the child was assigned the role of the listener. The speaker produced uninformative messages on eight trials, and fully informative messages on the remaining four trials.

After completion of the last trial, the subject was thanked, asked not to talk about the game, and escorted back to the classroom. The delayed test offered no prizes or awards; indeed, none were needed as all of the children were willing and even eager to participate again.

Dependent Measures

The dependent measures of principal interest were the number of questions asked and the number of correct referents selected by each child.

We also examined the kinds of questions asked by the listeners. Three categories of questions were distinguished here: useful, egocentric, and "other" questions. Useful questions sought relevant information about the identity of the

referent. Egocentric questions assumed that the speaker had the same viewpoint as the listener (e.g., "Is it this one [pointing out of the speaker's line of sight]?"). Any other (e.g., task-irrelevant) questions were coded as falling into the "other" category. Questions were coded by two independent raters using transcripts of each experimental session. The coders were in exact agreement on the classification of 98% of all questions. Discrepancies were resolved by discussion.

Results

Preliminary analyses indicated no significant effects of subjects' sex on any of the dependent variables, so the data were collapsed across sex for all further analyses.

One purpose of this study was to examine expected interactive effects of the two training procedures. Accordingly, the number of questions asked and the number of correct referent choices made by each child were analyzed using separate 2 (model or no model) x 2(plan or no plan) ANOVAs. Contrary to expectations, these analyses revealed no significant effects, and the hypothesis about interactive effects of training was abandoned.

Our second main hypothesis was that children who received any training would perform more effectively than untrained children. This hypothesis was tested using planned comparisons. Equal weights were assigned to the three training groups, which were contrasted with the control condition. All tests were one-tailed.

Immediate Test

The data from the immediate test are presented in Figures 1 and 2. As predicted, the trained groups asked more questions than the control group, $t(36)=2.74$, $p<.01$[2]. However, contrary to predictions, trained subjects did not select more correct referent choices than the controls, $t(36)=1.24$, $p<.12$. This latter figure is misleading, however, since a number of correct choices, particularly in the in the control group, were made in the absence of adequate information. We

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Insert Figures 1 and 2 about here

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classified such choices as guesses. The probability of guessing correctly was affected by the amount of information the listener had, i.e., information from the initial message and from answers to listener questions. Since transcripts had been made of each session, it was possible to correct for the chance factor of guessing. The number of trials for which children had enough information to select the correct referent was determined. Those correct choices based on inadequate information were excluded. These data are also presented in Figure 2. When this correction was made, the performance of the training groups was significantly more effective than that of the control group, $t(36)=2.45$, $p<.01$.

Delayed Test

The data from the delayed test are also included in Figures 1 and 2. As predicted, the trained groups asked more questions than the control group, $t(36)=3.13$, $p<.01$. These questions were asked primarily on the eight trials with uninformative messages. On these trials, the trained groups asked more questions, $t(36)=3.21$, $p<.01$, and selected more correct referents, $t(36)=2.46$, $p<.01$, than the control group. As might be expected, the effect for number of correct referent choices is even stronger when the correction for guessing is calculated, $t(36)=2.84$, $p<.01$. All groups performed equally well on the four control trials with the fully informative messages; there were no significant differences for either the number of questions asked or for the number of correct choices between conditions on these trials.

Types of Questions

The overwhelming majority of questions asked by the listeners were categorized as useful. Of the 327 questions asked on the immediate test, 314 (96%) were useful. There were 337 questions on the delayed test, with 320 (95%) categorized as useful. The training groups asked more useful questions than the control group on both the immediate test, $t(36)=2.65$, $p<.01$, and the delayed test, $t(36)=3.21$, $p<.01$. There were too few questions in the "other" and "egocentric" categories to merit further examination.

Message Type

Separate 2(model or no model) x 2(plan or no plan) ANOVAs with a repeated measure for type of message (fully informative, partially informative, uninformative) were used to analyze both the number of questions listeners asked and the number of correct referents they selected on the immediate test. The amount of information in the speaker's messages had a strong influence on the number of questions asked by the listeners, $F(2,72)=44.69$, $p<.01$. Individual comparisons indicated that children asked more questions for partially informative messages than on fully informative messages, $F(1,36)=32.45$, $p<.01$, and more questions on uninformative trials than on partially informative trials, $F(1,36)=38.44$, $p<.01$, indicating that question-asking was highly discriminative.

The analysis for number of correct choices also revealed a main effect for the type of message, $F(2,72)=35.51$, $p<.01$. Individual comparisons indicated that overall, listeners selected more correct choices on fully informative trials than on partially informative trials, $F(1,36)=40.34$, $p<.01$. In addition, subjects selected more correct referents on the partially informative than on the uninformative trials, $F(1,36)=13.16$, $p<.01$. There were no significant interactions on either analysis with message type.

Stimulus Type

As mentioned earlier, half of the trials on the immediate test used easily nameable items, while the other half used abstract figures. The means for number of questions asked as a function of stimulus type are presented in Table 1.

Insert Table 1 about here

As can be seen in the table, subjects in the trained groups asked more questions on the partially informative and uninformative trials, relative to the controls, for both nameable and abstract items. The data for the fully informative trials indicated that few questions were asked, and these did not differ across groups. Again, children's tendencies to ask questions were highly discriminative with

both nameable and abstract stimuli.

The corresponding raw data for the number of correct choices indicated that the trained groups performed better than the controls only on the partially informative trials with nameable items, $t(36)=2.63$, $p<.01$. However, when the correction for guessing was applied to these data, results showed that the trained groups selected more correct choices than the controls for all trials except the most difficult (i.e., uninformative trials with abstract figures) and even then the results approached significance. As expected, no differences emerged between groups on the fully informative trials, with either nameable or abstract items.

Frequency Data

We also sought to examine the researchers' post hoc observation that children either seemed to "catch on" to the requirements of the listening situation, or they did not, but that there were few intermediate cases. On the immediate test, 23.3% of the trained listeners asked no questions, 16.6% asked between one and seven questions, while 60.0% asked eight or more questions. The corresponding figures for the control subjects were 70%, 20%, and 10%. For the delayed test, these figures were 23.3%, 13.3%, 63.3% for the trained subjects; and 70%, 10%, and 20% for the controls. Almost without exception, children remained in the same category for both tests. For example, a child who asked no questions on the immediate test was not likely to ask any on the delayed test. In support of the experimenters' observations, these data suggest that children learned the necessary skills in an all-or-none fashion.

Pre-Game Interview

The interview was undertaken to assess the subjects' understanding of the task. Results showed that subjects in all conditions had a perfect or near-perfect understanding of the rules of the game. Two conditions achieved perfect mean performances of 6.0 correct (of the six questions in the interview), while the other two groups had means of 5.9 questions correct.

Discussion

In support of the findings reported by Cosgrove and Patterson (in press), the present data indicate that young children can be taught important listener skills for referential communication. As expected, both the use of plans and the use of modeling were effective techniques for this purpose. Contrary to predictions, however, both types of training together were no more effective than either one presented individually.

The data demonstrated not only the immediate efficacy of the training procedures, but also a significant degree of generalization. Treatment effects persisted undiminished over a period of days (and, in two cases, a period of weeks). The effects of training also showed substantial transfer to difficult, abstract stimuli. Children not only used the trained skills, but used them appropriately, requesting more information only when necessary for optimal performance in the listener role. The degree of generalization both across time and stimuli observed here suggests that the underlying principles of the training procedures must have been largely internalized by the subjects--i.e., adopted by the listeners as guides for their own behavior. These findings seem all the more remarkable in light of the relatively brief training procedures used here, and the generally negative findings of previous attempts to train referential communication skills (cf. Glucksberg et al., 1975).

Since the speaker for the immediate test was present during training, and was therefore not unaware of the subjects' experimental assignments, it might be argued that the children's performances were influenced by the speaker's incidental verbal and/or nonverbal behavior, rather than by the training procedures. However, it is difficult to reconcile this argument with the fact that performance improvements were maintained on the delayed test, with a new speaker who was blind to subjects' conditions. Hence, it seem unlikely that the experimental effects reflect demand characteristics in this sense.

Another potential problem in interpretation of the training procedures' effects on children's performances revolves around the question of why children in the control (no training) condition asked so few questions even when they needed additional information. If these children's relatively poor listener performances resulted from a feeling that questions were inappropriate or "not allowed" in the context of the communication game, then the data on treatment effects would, of course, be of considerably less interest.

To check on this possibility, one of the questions in the pre-game interview assessed whether or not it was permissible to ask questions during the game if the child so desired. The data from these interviews show quite clearly that almost every child answered this and other questions about the rules correctly, and that there were no significant differences between conditions in this regard. Moreover, any misunderstandings about the rules were corrected before beginning the test trials. Hence, it is unlikely that the failure of children in the control condition to request additional clarification when necessary resulted from the feeling that it was "against the rules" to do so.

A question which remains essentially open, however, is why the current training procedures were successful in facilitating children's communicative performances, especially when others have had less marked success. Of course, one possibility is that other attempts to train children's communication skills have focussed on the speaker's role (e.g., Fry, 1966, 1969; Shantz & Wilson, 1972), whereas the present procedures were aimed at facilitation of listener performance. It is not yet clear whether procedures such as the ones used here would also facilitate children's performances as speakers.

It is also worth noting that the training procedures employed in the present study differ in a number of respects from those used in much of the earlier research. Both the plans and modeling procedures used here indicated not only the nature of appropriate behavior, but also the circumstances under which such actions

should be undertaken. In contrast, various types of practice employed in previous research (e.g., Fry, 1966, 1969; Shantz & Wilson, 1972) rely on the subject to discover for himself both the nature of appropriate actions and the contexts in which such actions are to be performed. While it is not possible at present to determine the relative importance of these and other factors, it seems likely that the success of present procedures may have resulted at least in part from the specification of such information.

The failure to observe increased facilitation of performance in the dual training condition (i.e., in the modeling and plan condition) was surprising, especially since (aside from the data from fully informative message trials) there is no indication of a ceiling effect in the present data. This finding suggests that children whose performances were unaffected by our training procedures would probably require much more extensive and effortful training procedures in order to derive any substantial benefit. The frequency data from the present study suggest that the success of any future efforts in this direction should be measured not only by average amounts of change, but also by the number of subjects who evidence any change at all.

The types of questions asked by the children were not influenced by the kind of training which they received. All of the trained listeners asked primarily useful questions, a findings which provides additional support for the results reported by Cosgrove and Patterson (in press). While that study used only easily labelled items which may be unlikely to elicit egocentric speech, the present study also employed abstract items which are relatively likely to induce inadequate responses from young children (cf. Glucksberg et al., 1975). However, our findings provide little if any evidence to suggest the existence of such egocentric activity on the part of the listeners, even with the abstract items.

While not specifically designed to test their hypothesis, data from the current study are certainly consistent with the argument advanced by Asher and

Parke (1975) that children's communication failures are due at least in part to a failure to compare referents and non-referents with the speaker's messages. In this regard, it is worth noting that the training techniques employed here may have encouraged listeners to make the necessary comparisons, as well as to take appropriate action when more information was needed. Although the relative importance of these two components of the training procedures is yet to be determined, it seems likely that both may be important elements of effective techniques for teaching children to communicate effectively.

References

Asher, S. R., & Parke, R. D. Influence of sampling and comparison processes on the development of communication effectiveness. Journal of Educational Psychology, 1975, 67, 64-75.

Bandura, A. Principles of behavior modification. New York: Holt, Rinehardt and Winston, 1969.

Bandura, A. Social learning theory. New York: Prentice-Hall, Inc., 1977.

Cosgrove, J. M. The effects of training on the development of referential communication skills in young listeners. (Doctoral dissertation, University of Virginia, 1976). (University Microfilm, in press).

Cosgrove, J. M., & Patterson, C. J. Plans and the development of listener skills. Developmental Psychology, in press.

Dickson,W.P. An instructional device for teaching verbal skills through structured interactions between children in a communication game. Unpublished doctoral dissertation, Stanford University, 1974.

Fry, C. L. Training children to communicate to listeners. Child Development, 1966, 37, 674-685.

Fry, C. L. Training children to communicate with listeners who have varying listener requirements. Journal of Genetic Psychology, 1969, 114, 153-166.

Glucksberg, S., Krauss, R. M., & Higgins, E. T. The development of referential communication skills. In F. D. Horowitz (Ed.), Review of child development research (Vol. IV). Chicago: University of Chicago Press, 1975.

Glucksberg, S., Krauss, R. M., & Weisberg, R. Referential communication in nursery school children: Method and some preliminary findings. Journal of Experimental Child Psychology, 1966, 3, 333-342.

Hetherington, E. M., & McIntyre, C. W. Developmental psychology. Annual Review of Psychology, 1975, 26, 97-136.

Krauss, R. M., & Glucksberg, S. The development of communication: Competence as a function of age. Child Development, 1969, 40, 255-266.

Krauss, R. M., & Weinheimer, S. Concurrent feedback, confirmation, and the encoding of referents in verbal communication. Journal of Personality and Social Psychology, 1966, 4, 343-346.

Liebert, R. M., Neale, J. M., & Davidson, E. S. The early window: Effects of television on children and youth. New York: Pergamon Press, Inc., 1973.

Miller, G. A., Galanter, E., & Pribram, K. H. Plans and the structure of behavior. New York: Holt, Rinehart, and Winston, 1960.

Patterson, C. J., & Mischel, W. Plans to resist distraction. Developmental Psychology, 1975, 11, 369-378.

Patterson, C. J., & Mischel, W. Effects of temptation-inhibiting and task-facilitating plans on self-control. Journal of Personality and Social Psychology, 1976, 33, 209-217.

Peterson, C. L., Danner, F. W., & Flavell, J. H. Developmental changes in children's response to three indications of communicative failure. Child Development, 1972, 43, 1463-1468.

Ross, H., & Balzer, R. H. Determinants and consequences of children's questions. Child Development, 1975, 46, 536-539.

Shantz, C. U., & Wilson, K. E. Training communication skills in young children. Child Development, 1972, 43, 693-698.

Whitehurst, G. J. The development of communication: Changes with age and modeling. Child Development, 1976, 47, 473-482.

Footnotes

[1]Two children in the modeling only condition became ill during the period between the two tests. They were tested upon their return to school, after one and two week absences. Both children performed in a manner similar to others in this condition, and their data are included in the results.

[2]Since a subject had to ask two relevant questions in order to get the necessary information on uninformative message trials, scores on this measure typically ranged from zero to two.

Table 1

Mean Number of Questions Asked and Mean Number of Correct Referent Choices (Corrected for Guessing) as a Function of Training, Speaker's Message, and Type of Stimulus Item

Message Type	Stimuli	Dependent Measure	Condition[a]: Modeling and Plan	Modeling Only	Plan Only	Control	Contrast: Training vs. Control, one-tailed t (36) =
partially informative	nameable	questions[b]	1.9(1.5)	1.6(1.6)	1.7(0.9)	0.3(0.9)	3.05***
partially informative	abstract	questions	1.9(1.9)	1.3(1.5)	1.2(1.3)	0.3(0.9)	2.22**
uninformative	nameable	questions	3.3(2.9)	3.3(2.9)	3.6(2.2)	0.9(2.0)	2.85***
uninformative	abstract	questions	3.7(2.9)	2.6(2.7)	2.6(2.3)	0.9(1.9)	2.27**
partially informative	nameable	correct choices[c]	1.8(1.4)	1.5(1.4)	1.6(0.8)	0.3(0.9)	3.08***
partially informative	abstract	correct choices	1.6(1.4)	1.1(1.2)	1.2(1.3)	0.3(0.9)	2.22**
uninformative	nameable	correct choices	1.1(1.3)	1.5(1.4)	1.3(1.2)	0.3(0.9)	2.24**
uninformative	abstract	correct choices	1.4(1.3)	0.9(1.1)	0.8(1.3)	0.4(1.0)	1.48*

[a] means (standard deviations)

[b] mean number of questions asked

[c] mean number of correct referent choices, corrected for guessing

***$p < .01$

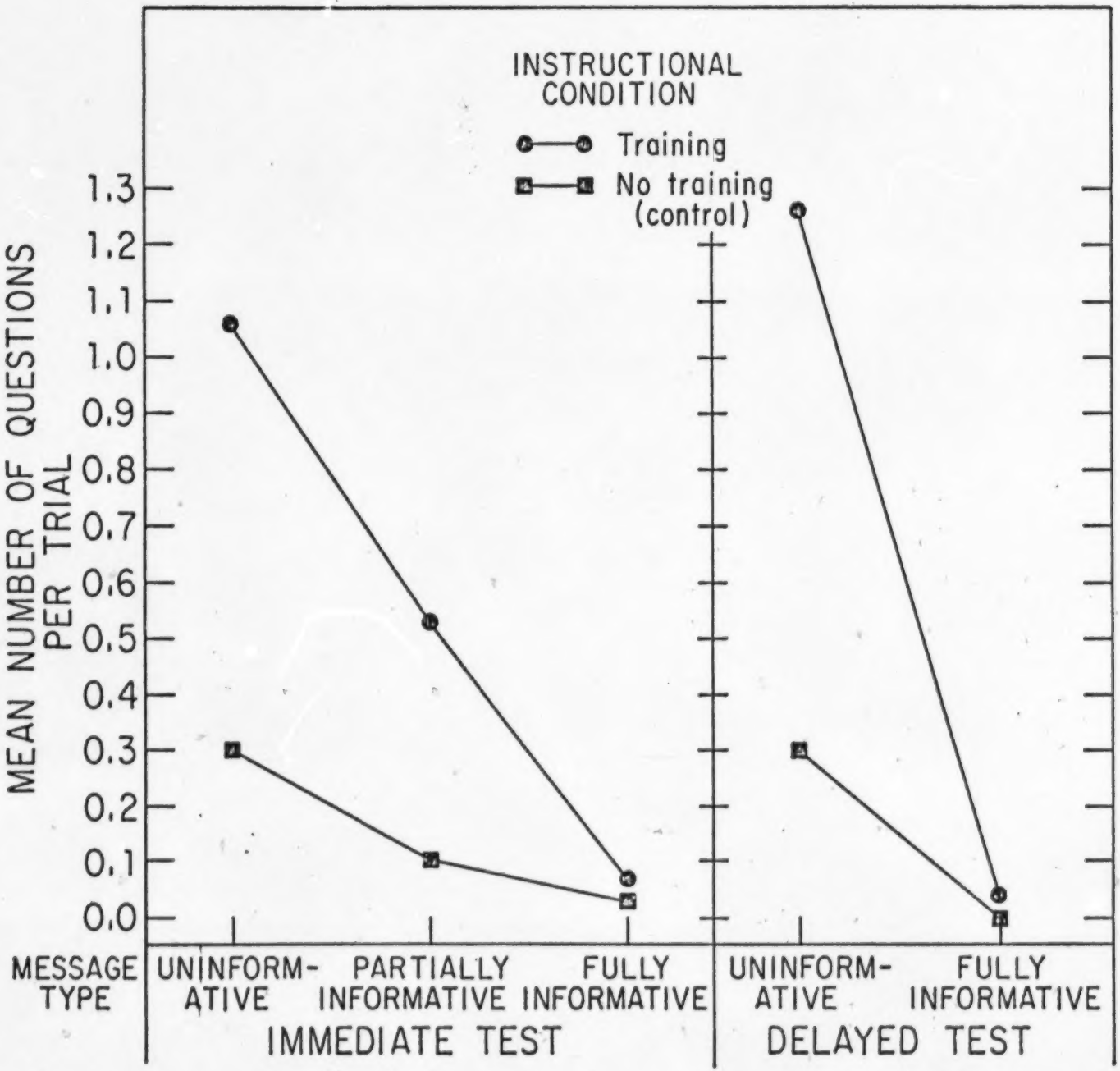
**$p < .02$

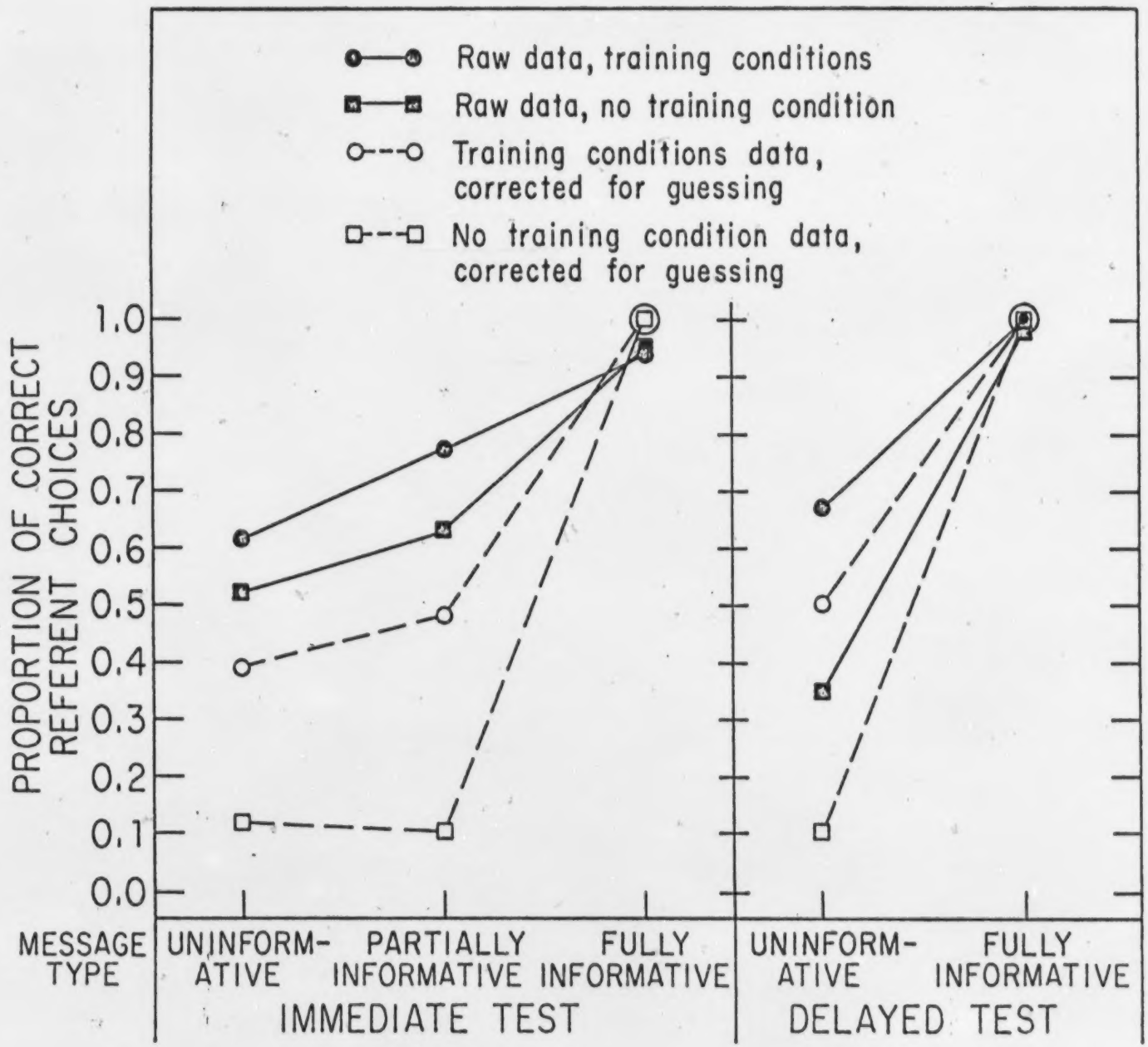
*$p < .08$

Figure Captions

Figure 1. Mean number of questions asked per trial as a function of condition, message type, and time of measurement.

Figure 2. Proportion of correct referent choices and proportion of correct referent choices corrected for guessing as a function of condition, message type, and time of measurement.


INSTRUCTIONAL CONDITION
Training
No training (control)
MEAN NUMBER OF QUESTIONS PER TRIAL
1.3
1.2
1.1
1.0
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0.0
MESSAGE TYPE
UNINFORM-ATIVE
PARTIALLY INFORMATIVE
FULLY INFORMATIVE
IMMEDIATE TEST
UNINFORM-ATIVE
FULLY INFORMATIVE
DELAYED TEST


Raw data, training conditions
Raw data, no training condition
Training conditions data, corrected for guessing
No training condition data, corrected for guessing
PROPORTION OF CORRECT REFERENT CHOICES
1.0
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0.0
MESSAGE TYPE
UNINFORM-ATIVE
PARTIALLY INFORMATIVE
FULLY INFORMATIVE
IMMEDIATE TEST
UNINFORM-ATIVE
FULLY INFORMATIVE
DELAYED TEST